



PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Spray Guns

We, FOUNDRY SERVICES LIMITED, of Long Acre, Nechells, Birmingham 7, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to spray guns, by which is meant devices which when supplied with compressed air and connected to a suitable liquid will produce a spray of the liquid. The invention moreover is concerned with arrangement in which the spray operation may need to alternate with a blowing operation and it is desirable that the change from one to the other should be made with the minimum of time and trouble. The chief object of the invention is to provide a spray gun of compact construction which will give these facilities.

According to the invention, a spray gun adapted to be supplied with compressed air and to spray a liquid located in a container is so constructed and dimensioned that a spray gun may be held and controlled by one hand for blowing, for spraying or for agitating the liquid in the container.

Preferably, a discharge nozzle, for instance of the venturi type, which is provided for the compressed air is so arranged that air passing therethrough is capable of producing a zone of reduced pressure in a supplying duct, for drawing up and discharging the liquid as a spray, an orifice being provided which connects such zone with the atmosphere and which is closable by the thumb or finger to cause the liquid to be sprayed.

A further supply duct provided in the spray gun for the compressed air preferably includes a self-closing valve arranged to lie under and to be operable by the thumb when the spray gun is held for use, while the liquid supply duct conveniently terminates in a spray nozzle which is arranged to surround the air discharge nozzle and to be axially adjustable in relation thereto to control the nature of the spray.

It is preferable for the spray nozzle to be located so as to be closable by the forefinger, with the hand in a position to operate the other controls, whereby the compressed air is

caused to pass down the liquid supply line. This is important in the case of liquids containing solid matter in suspension where settling is likely to take place in course of time and thus the spray will not be of the character required.

In order that the invention may be readily understood, one preferred constructional form will now be described by way of example in conjunction with the accompanying drawing, in which:

Fig. 1 shows a sectional side view of a spray gun;

Figs. 2, 3 and 4 show the spray gun as held for use for blowing, for spraying and for agitating the liquid respectively.

Referring to Fig. 1, the spray gun comprises a metal casting 10 shaped to fit the hand and provided at its lower end with two connectors 11, 12 for tubes 13, 14 for supplying the compressed air and extending to the liquid container respectively. On the upper surface of the gun is located a push button or trigger 15, which when operated serves to admit compressed air by operating a valve 16 of the self-closing type. The compressed air passes from the connector 11 to the valve 16 through a passage 17 and then through a further suitably drilled passage 18 to a conical discharge nozzle 19. Substantially at right-angles thereto, a passage 20 for the liquid extends round the base of this nozzle 19 and is prolonged to form an orifice 21 disposed in the top surface of the gun beyond the push button 15. The air nozzle 19 projects into a liquid delivery nozzle 22 which is formed with a conical interior surface 23 to co-operate with the conical part 19a of the nozzle 19 and is axially adjustable by rotating it in a threaded seating 24. A lock nut 25 is provided for securing the nozzle 22 in any desired position with respect to the nozzle 19.

By a suitable grip of the gun, as shown in Fig. 3, the base of the thumb can be made to operate the trigger or push button 15 and the ball of the thumb can be used to cover the orifice 21. When only the base of the thumb is in action, as shown in Fig. 2, a blast of compressed air is produced and when the thumb is used to close the orifice 21 a spray

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of the liquid is produced. Finally, referring to Fig. 4, if the first finger is made to cover or partially cover the delivery nozzle 22, compressed air is forced down the liquid tube 14 and serves to clean it and bring about agitation of the liquid. It will be understood that, instead or in addition, control of the liquid may be effected by a positively-operated valve in the liquid line.

10 The gun is particularly applicable to the requirements of foundry workers where the blast can be used for cleaning the mould or pattern and then in a moment operation of the gun can be changed merely by closing the orifice 21 to enable dressing to be applied. 15 Many of the dressings ordinarily used contain solids in suspension and it is therefore advantageous to be able to agitate the liquid from time to time to ensure that the character of the spray does not change owing to settling taking place. It will be understood that the degree of agitation can be varied by the extent to which the delivery nozzle 22 is closed by the forefinger.

25 Conveniently the delivery nozzle 22 is readily removable and nozzles 19 with different sized holes would be used to suit the available pressure of compressed air. As already pointed out the extent to which the delivery nozzle 22 is screwed into the body of the gun will determine the density of the spray, the nozzle 22 being secured in position by the lock nut 25.

In order to make the spray gun suitable 35 for dealing with liquids of differing densities and viscosities, the liquid supply passage 20 is conveniently dimensioned to suit the densest and most viscous liquid which the gun will employ, and an interchangeable throttle piece 26 is screwed into a suitable 40 tapping 27 in the passage 20 where the latter joins the air passage 18. The throttle piece 26 has a central bore 28 of a size suitable for the particular liquid in use and is conveniently provided with a transverse slot 29 45 in one end so that, after slacking off the lock nut 25 and removing the two nozzles 19 and 22, the throttle piece can be installed or removed by way of the orifice 21 with the help 50 of a screwdriver.

The invention therefore provides a handy tool particularly suitable for workers in the foundry industry enabling them to perform

the various operations required in the course of their work with the minimum of fatigue 55 and delay.

What we claim is:—

1. A spray gun adapted to be supplied with compressed air and to spray a liquid located in a container, which is so constructed and 60 dimensioned that the spray gun may be held and controlled by one hand for blowing, for spraying or for agitating the liquid in the container.

2. A spray gun as claimed in Claim 1 in 65 which a discharge nozzle provided for the compressed air is so arranged that air passing therethrough is capable of producing a zone of reduced pressure in a supply duct, for drawing up and discharging the liquid as a 70 spray, an orifice being provided which connects such zone with the atmosphere and which is closable by the thumb or finger to cause the liquid to be sprayed.

3. A spray gun as claimed in Claim 1 or 75 2 in which a supply duct provided for the compressed air includes a self-closing valve arranged to lie under and to be operable by the thumb when the spray gun is held for use.

4. A spray gun as claimed in Claim 2 or 80 Claims 2 and 3 in which the liquid supply duct terminates in a spray nozzle arranged to surround the air discharge nozzle and to be axially adjustable in relation thereto to 85 control the nature of the spray.

5. A spray gun as claimed in Claim 4 in which the spray nozzle is located so as to be closable by the forefinger with the hand in a position to operate the other controls, 90 whereby the compressed air is caused to pass down the liquid supply duct for causing said agitation of the liquid.

6. A spray gun as claimed in Claim 2 or 95 any claim dependent thereon in which an interchangeable throttling device is provided in the liquid supply duct for altering the cross-section thereof so as to suit liquids of differing densities and viscosities.

7. A spray gun substantially as herein- 100 before described and as shown in the accompanying drawing.

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PROVISIONAL SPECIFICATION

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to a suitable liquid will produce a spray of 110 the liquid. The invention moreover is concerned with arrangements in which the spray operation may need to alternate with a blowing operation and it is desirable that the change from one to the other should be made with the minimum of time and trouble. The 115

chief object of the invention is to provide a compact construction of spray gun which will give these facilities.

According to the invention a spray gun adapted to be supplied with compressed air and to spray a liquid located in a container is so constructed that controls may be exerted by the thumb and fingers of one hand whereby alternatively the gun may be used for blowing, for spraying or for agitating the liquid in the container. For this purpose it is arranged that the compressed air passes through a suitable nozzle, for instance of the venturi type, whereby the liquid is sucked up from the container by the reduction of pressure produced. An orifice is provided connecting the zone of reduced pressure to the atmosphere so that as long as this orifice remains open no spraying will take place and the gun will merely produce a blast of compressed air. If however this orifice is closed spraying takes place in known manner. If in addition a restriction is placed on the delivery nozzle, the compressed air will pass down the tube extending to the liquid container and may therefore be caused to bubble through the liquid and agitate it. This is important in the case of liquids containing solid matter in suspension where settling is likely to take place in course of time and thus the spray will not be of the character required.

In a preferred constructional form of the invention the gun comprises a metal casting shaped to fit the hand and provided at its lower end with two connectors for the tubing supplying the compressed air and extending to the liquid container respectively. On the upper surface of the gun is a push button or trigger which when operated serves to admit compressed air by operating a valve of the self-closing type. The compressed air passes through a suitably drilled passage to a conical nozzle. Substantially at right-angles thereto the passage for the liquid extends round the base of this nozzle and is prolonged to form the orifice previously mentioned. The air nozzle projects into a delivery nozzle which is formed with a conical interior to co-operate with the conical part of the

nozzle and is axially adjustable by rotating it in a threaded seating.

By a suitable grip of the gun the base of the thumb can be made to operate the trigger or push button and the ball of the thumb can be used to cover the orifice. When only the base of the thumb is in action, a blast of compressed air is produced and when the thumb is used to close the orifice a spray of the liquid is produced. If then the first finger is made to cover or partially cover the delivery nozzle, compressed air is forced down the liquid pipe and serves to clean it and bring about agitation of the liquid. It will be understood that instead or in addition, control of the liquid may be effected by a positive-operated valve in the liquid line.

The gun is particularly applicable to the requirements of foundry workers where the blast can be used for cleaning the mould or pattern and then in a moment operation of the gun can be changed to enable dressing to be applied. Many of the dressings ordinarily used contain solids in suspension and it is therefore advantageous to be able to agitate the liquid from time to time to ensure that the character of the spray has not changed owing to settling taking place. It will be understood that the degree of agitation can be varied by the extent to which the delivery nozzle is closed by the forefinger.

Conveniently the delivery nozzle is readily removable and nozzles with different sized holes would be used to suit the available pressure of compressed air. As already pointed out the extent to which the nozzle is screwed into the body of the gun will determine the density of the spray and the position is preferably secured by a lock nut.

The invention therefore provides a handy tool particularly suitable for workers in the foundry industry enabling them to perform the various operations required in the course of their work with the minimum of fatigue and delay.

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